

WHAT IS CLAIMED IS:

1. A method for sterilizing an embolic composition comprising a hydroxyl-containing rheological modifier in an effective amount to impart shear thinning, pseudo-plastic properties to the composition which method comprises exposing the composition to a sufficient amount of irradiation to effect sterilization under conditions such that the sterilized composition exhibits a minimal change in its thixotropic behavior as compared to the composition prior to sterilization wherein such minimal change is characterized by an area between the two curves measuring shear stress at increasing and decreasing shear rates measured at from 0 to 250 s⁻¹ of no more than about 25,000 Pa/sec.
2. The method according to Claim 1, wherein the area between the two curves is from about area 1,000 to about 20,000 Pa/sec.
3. The method according to Claim 2, wherein the area between the two curves is from about 2,500 to about 15,000 Pa/sec.
4. The method according to Claim 1, wherein the irradiation is gamma irradiation.
5. The method according to Claim 1, wherein the irradiation is electron beam irradiation.
6. The method according to Claim 1, wherein the hydroxyl-containing rheological modifier is amorphous, fumed silica.
7. A sterilized embolic composition comprising a hydroxyl-containing rheological modifier in an effective amount to impart shear thinning, pseudo-plastic properties to the composition wherein the sterilized composition exhibits a minimal change in its thixotropic behavior as compared to the composition prior to sterilization wherein such minimal change is characterized by an area between the two curves measuring shear stress at increasing and decreasing shear rates measured at from 0 to 250 s⁻¹ of no more than about 25,000 Pa/sec.

8. The sterilized embolic composition according to Claim 7 wherein the area between the two curves is from about area 1,000 to about 20,000 Pa/sec.

9. The sterilized embolic composition according to Claim 8 wherein the area between the two curves is from about area 2,500 to about 15,000 Pa/sec.

10. The sterilized embolic composition according to Claim 7, wherein the sterilized composition is further characterized by exhibiting an increase of less than about 25% of its viscosity at 37°C over a shelf-life of 6 months or more at a high shear of 250 sec⁻¹ as compared to the viscosity under the same conditions immediately after sterilization..

11. The sterilized embolic composition according to Claim 10, wherein the sterilized composition is further characterized by exhibiting an increase of less than about 20% of its viscosity at 37°C over a shelf-life of 6 months or more at a high shear of 250 sec⁻¹ as compared to the viscosity under the same conditions immediately after sterilization.

12. The sterilized embolic composition according to Claim 11, wherein the sterilized composition is further characterized by exhibiting an increase of less than about 15% of its viscosity at 37°C over a shelf-life of 6 months or more at a high shear of 250 sec⁻¹ as compared to the viscosity under the same conditions immediately after sterilization.

13. The sterilized embolic composition according to Claim 12, wherein the sterilized composition is further characterized by exhibiting an increase of less than about 10% of its viscosity at 37°C over a shelf-life of 6 months or more at a high shear of 250 sec⁻¹ as compared to the viscosity under the same conditions immediately after sterilization.

14. The sterilized embolic composition according to Claim 7, wherein the composition further comprises a water insoluble, biocompatible polymer, a

biocompatible solvent which dissolves the biocompatible polymer in the amounts employed and optionally a visualizing effective amount of a contrast agent.

15. The sterilized embolic composition according to Claim 14, wherein the composition, in the absence of the rheological modifier, has a viscosity of at least 150 cP at 37°C.

16. The sterilized embolic composition according to Claim 15, wherein the composition, in the absence of a rheological modifier, has a viscosity of at least 100 cP at 37°C.

17. The sterilized embolic composition according to Claim 7, wherein the composition further comprises a prepolymer and a visualizing effective amount of a contrast agent wherein the prepolymer, upon polymerization, forms a water insoluble, biocompatible polymer.

18. The sterilized embolic composition according to Claim 17, wherein the composition has a viscosity of no more than 150 cP at 37°C in the absence of a rheological modifier.

19. The sterilized embolic composition according to Claim 17, wherein the composition has a viscosity of no more than 100 cP at 37°C in the absence of a rheological modifier.

20. The sterilized embolic composition according to Claim 7, wherein the hydroxyl-containing rheological modifier is amorphous, fumed silica.

21. A method for sterilizing an embolic composition comprising a hydroxyl-containing rheological modifier in an amount sufficient to impart shear thinning, pseudo-plastic properties to the composition, which method comprises exposing the composition to a sufficient amount of heat or irradiation to effect sterilization under conditions wherein the sterilized composition exhibits a minimal increase in its thixotropic behavior as compared to the composition prior to sterilization which method comprises selecting an embolic composition comprising a hydroxyl-containing rheological modifier wherein

at least about 25% of the surface hydroxyl groups have been converted to non-hydroxyl groups and sterilizing said composition such that the sterilized composition exhibits a minimal change its thixotropic behavior as compared to the composition prior to sterilization which such minimal change is characterized by an area between the two curves measuring shear stress at increasing and decreasing shear rates measured at from 0 to 250 s^{-1} of no more than about 25,000 Pa/sec.

22. The method according to Claim 21 wherein the area between the two curves is from about 1,000 Pa/sec to about 20,000 Pa/sec.

23. The method according to Claim 22 wherein the area between the two curves is from about 2500 Pa/sec to about 15,000 Pa/sec.

24. The method according to Claim 21, wherein at least about 50% of the surface hydroxyl groups have been converted to non-hydroxyl groups.

25. The method according to Claim 24, wherein at least about 90% of the surface hydroxyl groups have been converted to non-hydroxyl groups.

26. The method according to Claim 25, wherein at least about 98% of the surface hydroxyl groups have been converted to non-hydroxyl groups.

27. The method according to Claim 21, wherein the sterilized composition is further characterized by exhibiting a reduction of less than about 25% of its viscosity over a 1 year shelf-life.

28. The method according to Claim 27, wherein the sterilized composition is further characterized by exhibiting a reduction of less than about 15% of its viscosity over a 1 year shelf-life

29. The method according to Claim 21, the hydroxyl-containing rheological modifier is amorphous fumed silica.

30. The method according to Claim 29, wherein the sterilized embolic composition further comprises a water insoluble, biocompatible polymer, a

biocompatible solvent which dissolves the biocompatible polymer in the amounts employed and optionally a visualizing effective amount of a contrast agent.

31. The method according to Claim 30, wherein the embolic composition, in the absence of the rheological modifier, has a viscosity of at least 150 cP at 37°C.

32. The method according to Claim 31, wherein the embolic composition, in the absence of a rheological modifier, has a viscosity of at least 10,000 cP at 37°C.

33. The method according to Claim 21, wherein the sterilized embolic composition further comprises a prepolymer and a visualizing effective amount of a contrast agent.

34. The method according to Claim 33, wherein the embolic composition, in the absence of the rheological modifier, has a viscosity of no more than 150 cP at 37°C.

35. The method according to Claim 34, wherein the embolic composition, in the absence of a rheological modifier, has a viscosity of no more than 100 cP at 37°C.

36. A sterilized embolic composition comprising a sufficient amount of a hydroxyl-containing rheological modifier to impart pseudo-plastic, shear thinning properties to the composition wherein at least about 25% of the surface hydroxyl groups have been converted to non-hydroxyl groups and further wherein said sterilized composition exhibits a minimal change in its thixotropic behavior as compared to the composition prior to sterilization wherein such minimal change is characterized by an area between the two curves measuring shear stress at increasing and decreasing shear rates measured at from 0 to 250 s⁻¹ of no more than about 25,000 Pa/sec.

37. The sterilized embolic composition according to Claim 36 wherein the area between the two curves is from about 1,000 to about 20,000 Pa/sec.

38. The sterilized embolic composition according to Claim 37 wherein the area between the two curves is from about 2,500 to about 15,000 Pa/sec.

39. The sterilized embolic composition according to Claim 36, wherein at least about 50% of the surface hydroxyl groups have been converted to non-hydroxyl groups.

40. The sterilized embolic composition according to Claim 39, wherein at least about 90% of the surface hydroxyl groups have been converted to non-hydroxyl groups.

41. The sterilized embolic composition according to Claim 36, wherein the sterilized composition is further characterized by exhibiting a reduction of less than about 25% of its viscosity over a 1 year shelf-life.

42. The sterilized embolic composition according to Claim 36, wherein the sterilized composition is further characterized by exhibiting a reduction of less than about 20% of its viscosity over a 1 year shelf-life.

43. The sterilized embolic composition according to Claim 42, wherein the sterilized composition is further characterized by exhibiting a reduction of less than about 15% of its viscosity over a 1 year shelf-life.

44. The sterilized embolic composition according to Claim 43, wherein the sterilized composition is further characterized by exhibiting a reduction of less than about 10% of its viscosity over a 1 year shelf-life.

45. The sterilized embolic composition according to Claim 36, wherein the sterilized embolic composition further comprises a water insoluble, biocompatible polymer, a biocompatible solvent which dissolves the biocompatible polymer in the amounts employed and optionally a visualizing effective amount of a contrast agent.

46. The sterilized embolic composition according to Claim 45, wherein the embolic composition, in the absence of the rheological modifier, has a viscosity of at least 150 cP at 37°C.

47. The sterilized embolic composition according to Claim 46, wherein the embolic composition, in the absence of a rheological modifier, has a viscosity of at least 100 cP at 37°C.

48. The sterilized embolic composition according to Claim 36, wherein the sterilized embolic composition further comprises a prepolymer and a visualizing effective amount of a contrast agent.

49. The sterilized embolic composition according to Claim 48, wherein the embolic composition, in the absence of the rheological modifier, has a viscosity of no more than 150 cP at 37°C.

50. The sterilized embolic composition according to Claim 49, wherein the embolic composition, in the absence of a rheological modifier, has a viscosity of no more than 100 cP at 37°C.